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ABSTRACT

In spring 1994, a study was conducted to compare student outcomes for instructors use of a mixed teaching repertoire (i.e., lecture, student-centered discussion, cooperative learning, and computer-assisted instruction) and those using lectures alone in social science, science/math, humanities, and business classes at Cosumnes River College, in California. Based on surveys of instructors and students and class observations, 22 matched pairs of courses were determined based on instructor technique. In addition, the ethnicity, gender, age, and English-as-a-Second-Language (ESL) status of the 812 students in the lecture-only and the 603 in the mixed-repertoire courses were analyzed to determine group outcomes. Study findings included the following: (1) attendance was generally better in lecture-based than in mixed-repertoire classes especially among 25 or older, native English speaking, white, and female groups; (2) while, students over 25, native English speakers, Asian/Pacific Islanders, Whites, and females earned higher grades in lecture-based courses, students under 25, ESL students, African-Americans, Hispanics, and males earned higher grades in classes using a mixed repertoire; (3) with respect to course completion rates, students in social science mixed-repertoire courses were significantly more likely to successfully complete than in lecture courses; and (4) while students felt they had opportunity to succeed regardless of methodology, they felt they had a greater opportunity to succeed in the lecture group. (Contains 16 references.) (KP)

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THE LEARNING EXPERIENCE: IMPACT ON MEASURES OF INSTITUTIONAL EFFECTIVENESS

By

Janis J. Caston

Cosumnes River College

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Introduction

I believe that institutional effectiveness includes various measures of student success such as course completion, final grades, and attendance. Community colleges have large enrollments of nontraditional students, including re-entry adults, minority, lower socioeconomic, and limited English speaking student populations. The California community college system is open to all adults who can benefit from instruction, regardless of high school academic preparation, achievement history, or aptitude test scores (Chancellor's Office, California Community Colleges, 1986; 1991).

Research suggests that re-entry adult students have significantly different perspectives on academics and college life than the traditional college student (Schlossberg, Lynch, & Chickering, 1989). Furthermore, Kelly (1992) wrote that students who speak English as a second language, as well as students from underrepresented minority groups, need a supportive learning environment to ensure their success in programs.

The Teaching-Learning Process

Several studies have focused on understanding the teaching-learning process in higher education, including community colleges. Findings generally support the notion that the teaching-learning process is a function of the interactions between academic content; the instructor's

objectives, expectations, behavior, and teaching methodologies; and the students' expectations, individual differences, and learning behavior. Clearly, the more diverse the student population, the more complex the teaching-learning process (Baxter Magolda, 1992; Dembo, 1991; McKeachie, 1986).

Community college instructors, while generally knowledgeable in their discipline areas, are frequently not trained in the pedagogical aspects of the teaching-learning process, normally expected of K-12 educators. As a result, they tend to teach as they were taught. The usual method is lecture, often including some instructor-led, full-class discussion (McKeachie, 1986). Instructors generally expect students to read assigned materials, come to class prepared, take notes from lectures, and demonstrate mastery of the material covered in graded summative objective and essay examinations. In addition, student grading procedures may also include an individually-prepared term project or paper.

The traditional lecture method, while time tested in community colleges, may not be appropriate as the only teaching strategy to effectively reach diverse students. McKeachie (1986) suggested that having a teaching repertoire that integrates more student-centered strategies, such as cooperative learning, student-directed discussion sessions, and activity-based assignments, into lecture courses may better match the needs of learners.

Purpose of the Study

The purpose of the study was to investigate the relationship between methodological differences in the teaching-learning process and successful course completion in community college social science, science/math, humanities, and business classes. The study concentrated on a comparison of instructors' use of a teaching repertoire (e.g., lecture, student-centered discussion, cooperative learning, and computer assisted instruction) with instructors' use of the lecture method alone. Differences related to race/ethnicity, gender, age, and English as a second language (ESL) were analyzed to determine whether differences in the teaching-learning process related to choice of methodology impacted various groups of students in different ways.

If the use of a teaching repertoire positively relates to successful course completion, it may be advisable to train community college instructors how to implement multiple teaching strategies in their courses. Thus, there are clear implications for staff development committees seeking ways to improve institutional effectiveness.

Research Questions

The following three questions were addressed in this study:

1. Comparing community college instructors who believe they have a teaching repertoire with those who believe they

do not, to what extent is there a difference in attendance and successful course completion:

a) of ESL students?

b) of minority students?

c) of re-entry adults?

d) of female versus male students?

2. Comparing community college instructors who believe they have a teaching repertoire with those who believe they do not, what is the effect on their students' perception of opportunity to succeed in the course:

a) of ESL students?

b) of minority students?

c) of re-entry adults?

d) of female versus male students?

3. Considering instructors' perception of the operational curriculum, to what extent do community college instructors achieve curriculum consonance?

Overview of Methodology

In order to answer these three questions, I used both quantitative and qualitative methods in a Spring 1994, semester-long, case study of Cosumnes River College. Research questions 1 and 2 were principally analyzed using quantitative methods. Research question 3 was analyzed using both quantitative and qualitative methods. A brief summary of the components of the research design follows.

Class Selection

To select classes for participation in the study, I administered a preliminary instructor survey to determine their planned use of a teaching repertoire or lecture. This survey--in addition to verification that the instructor was regarded by his/her dean as an highly qualified, successful educator; inclusion of the class in the Spring 1994 class schedule; availability of a suitable comparison class; and the instructor's willingness to participate in the study--was used to select purposefully matched pairs of classes in humanities, social science, science/math, and business curriculum areas.

Quantitative Methods

I surveyed students enrolled in each of the classes included in the study to obtain their perceptions of the methodologies used in the class, congruence of the course content with the course syllabus, and anticipated learning outcomes. A parallel survey of instructors was administered to obtain their perspectives of teaching methodologies used, congruence of course content with formal curriculum documentation, and expected student outcomes.

In addition, I used various institutional reports to gather comparative data about the college as well and each course included in the study. Among these were Student Master File downloads and Class Enrollment reports.

Finally, I obtained instructor-generated daily attendance and final grades for each student.

Qualitative Methods

In addition to the quantitative methods described above, I completed a nonparticipant classroom observation of each class to further ascertain whether the class was taught using a teaching repertoire or primarily by lecture.

Research question 3 was primarily analyzed by comparing the approved formal curriculum and the course syllabus prepared by the instructor, in addition to survey information obtained from both the instructor and the students.

Assumptions

The following assumptions are inherent in this study:

1. All instructors selected for the study were essentially equally effective, typical community college teachers. This was based on their having received a rating of "meets or exceeds standards" on all criteria in the faculty evaluation and having been recommended by their dean to be included in the study. Therefore, the primary difference between instructors teaching matched pairs of classes included in the study was their choices to use a repertoire or lecture methodologies.

2. Students who enrolled in similar classes in like disciplines did so based upon such determinants as program requirements, interest in the subject matter, and

convenience rather than for reasons related specifically to the instructor's choice of teaching methodology.

3. Students and instructors understood and responded honestly to the survey questions; the nonparticipant observation was done in a "typical" class period; and the course syllabus honestly and accurately reflected the operational curriculum as perceived by the instructor.

Limitations

Given the nature of this study, the following limitations are inherent:

1. Results may not generalize to other student populations, other disciplines and community college classes, or other community colleges.

2. The interactions between teaching methods, student characteristics, student motivation, instructor characteristics, and methods of assessment were not controlled in this study. This is a major limitation in analyzing the effect of teaching methodologies on measures of successful course completion.

3. My presence as an observer in the classroom might have affected the teaching strategies used by the instructors.

4. Since all instructors participating in the study were volunteers, they may not have been typical of the general population. Furthermore, since the instructors knew they were participating in a study, the Hawthorne Effect may

have impacted study results, particularly given the relatively short duration of the study.

5. Instructors' perceptions of their own instructional competence/repertoire may not have been accurate.

Presentation of Major Findings

The major findings are presented as follows: a discussion of Cosumnes River College and the case study sample, including an analysis of placement of classes into lecture or repertoire groups, followed by the findings related to each of the three research questions.

Cosumnes River College/Study Demographics

Cosumnes River College is located in Sacramento, California. According to the 1990 census, the metropolitan area of Sacramento had a population of approximately 1.5 million in the three county area including Sacramento, Yolo, and El Dorado counties. Cosumnes River College is one of three community colleges and two educational centers in the Los Rios Community College District (LRCCD) serving this population. The total headcount for the LRCCD in spring 1994 was approximately 50,000 students (Los Rios Community College District, 1994).

Table 1, Demographics of Cosumnes River College and Study Participants by Percent of Headcount, compares age, use of English language, race/ethnicity, and gender of participants. Approximately 11 percent of the total student population participated in the study. The number of

participants in the study reflects duplicated student count while the college enrollment is an unduplicated count. The unduplicated count for the study was 1,315 students; 85 students were enrolled in two class sections, 6 students in three class sections, and 1 student in four class sections.

Using Bean and Metzger's (1985) definition of nontraditional college students as adults 25 and over, a comparison of student age revealed a younger student in the study sample than in the general population. The English as a second language (ESL) population in the study was slightly higher than the college population. Furthermore, the study participants included approximately 4 percent more female students than the college as a whole. The Fall 1993 College Matriculation Study found that day populations included a higher percentage of younger students, female students, and ESL students than evening populations (Cosumnes River College, 1994). Thus, each of these findings can be attributed to the fact that the majority of class sections included in the study were day sections.

In terms of ethnicity, the college population was less diverse than the study population. For example, the college population of Asian/Pacific Islanders was 16.4 percent while the study percentage was 24.4 percent. Similarly, approximately 4 percent more African American and Hispanic students were included in the study than were identified in the college population.

Table 1

Demographics of Cosumnes River College and Study Participants by Percent of Headcount

Attribute	College	Study
Headcount	10,952	1,415
Age:		
Under 25	47.0	66.9
25 and Over	53.0	33.1
Language:		
English is first language	91.6	91.5
English is second language	8.4	8.5
Race/Ethnicity:		
Native American	2.1	2.1
Asian/Pacific Islander	16.4	24.4
African American	9.5	13.4
White	57.1	43.0
Hispanic	9.6	12.3
Other	5.3	4.8
Gender:		
Female	58.0	62.3
Male	42.0	37.7

Table 2, Demographics of Study Participants in Methodology Groups by Percent of Headcount, displays differences between the two groups included in this study.

Table 2

Demographics of Study Participants in Methodology Groups by Percent of Headcount

Attribute	Lecture	Repertoire
Headcount	812	603
Age:		
Under 25	65.8	68.5
25 and Over	34.2	31.5
Language:		
English is first language	92.0	90.8
English is second language	8.0	9.1
Race/Ethnicity:		
Native American	2.3	1.8
Asian/Pacific Islander	24.1	24.7
African American	13.1	13.8
White	42.6	43.6
Hispanic	12.6	11.9
Other	5.3	4.2
Gender:		
Female	62.7	62.0
Male	37.3	38.0

While the groups were demographically similar as displayed in Table 2, students in the lecture group were older, with fewer ESL students, fewer Asian/Pacific Islander and African American students and more Native American and Hispanic students than found in the profile of the repertoire group. In addition, there were more female and fewer male students in the lecture group. The differences, however, were all relatively small.

The study sample included courses in four curriculum categories: business, humanities, science/math, and social science. Where exact course matches were not possible, closely related courses were compared. Six of the 22 purposefully matched pairs were not exact course title matches. In each case, however, instructors and deans provided verification that the courses were closely related in terms of course objectives and content. Total enrollments in each curriculum category by methodology are shown in Table 3, Curriculum Category Enrollments by Methodology Group. As displayed in Table 3, regardless of curriculum category, enrollments in the lecture group were larger than enrollments in the repertoire group. This difference is particularly noteworthy in the humanities and science/math curriculum groups. Differences in class size were less pronounced in social science and business curriculum groups.

Table 3

Curriculum Category Enrollments by Methodology Group

Curriculum Category	Enrollments	
	Lecture	Repertoire
Business	112	101
Humanities	210	140
Science/Math	292	180
Social Science	198	182
Total Enrollment	812	603

Assignment of Matched Pairs to Methodology Group

Each class in a purposefully matched pair was assigned to either the lecture or repertoire methodology group based on four criteria. These criteria included the opinions of the instructor and the students based on the mean value of their respective responses to survey questions about the teaching/learning process. In addition, my opinion was included based on my nonparticipant observation and analysis of the course syllabus. The method used was to sum the values assigned to each of the four criteria. The higher the total for each course, the greater the consensus that the course included use of a repertoire of teaching methodologies.

Summary

The study sample provided a reasonable representation of the college demographics. In addition, while the repertoire group was smaller in size than the lecture group, both groups were representative of the college demographics. Furthermore, classes were placed into the lecture or the repertoire group through a systematic process that included four perspectives. As a result, the findings from the three research questions can reasonably be used to draw inferences for purposes of this investigation.

Question 1: Attendance/Successful Course Completion

Research findings for question 1, "Comparing community college instructors who believe they have a teaching repertoire with those who believe they do not, to what extent is there a difference in attendance and successful course completion?" were mixed. Findings are presented separately for attendance and successful course completion.

Attendance

Overall, attendance was better in lecture-based classes than it was in those classes that emphasized a repertoire of teaching methodologies. This finding can be explained by the inherent importance of a student's attending class if the source of information is the instructor. On the other hand, if the student is responsible for his or her own learning, engaged time could have occurred at times other

than the scheduled class meeting. As a result, attendance became less important.

Table 4, Attendance by Methodology Group, provides detailed attendance data. Attendance was defined as the mean percent of time students attended class. The number was derived by first computing the percent of attendance for every student in each class. The percent of attendance for each student was calculated by counting the number of days that the student was in attendance divided by the number of times the class was scheduled to meet during the semester. For example, if a student attended 45 sessions of a class scheduled to meet 50 times, the attendance would be 90 for that student. Class attendance was the average for all students enrolled in a given class.

As is shown in Table 4, overall attendance was significantly better in lecture classes. In addition, significant findings included attendance of re-entry (25 and over), native English speaker, white, and female groups. In each case attendance was better in the lecture group. In fact, with the exception of one finding, all favored the lecture-based classes. That one exception was the Native American group, which included a small sample of 17 students in the lecture group and 8 in the repertoire group. While not statistically significant, attendance was better in the repertoire group. Research supports the notion that this particular race/ethnic group tends to be more successful

when there is group support (Khan & Donlevy, 1991). This may partially explain the finding.

Table 4

Attendance by Methodology Group

	Lecture			Repertoire			Statistics		
	N	M	SD	N	M	SD	t	df	p
OVERALL	641	89	14	422	86	17	2.7	1,061	.007
AGE									
Under 25	407	87	15	280	86	15	1.1	685	.278
25 and Over	234	91	11	140	86	20	3.0	372	.003
LANGUAGE									
ESL	52	91	11	33	90	13	.6	83	.549
English	589	89	14	387	86	17	2.7	974	.008
RACE/ETHNICITY									
Native Amer	17	88	16	8	89	11	-.2	23	.862
Asian/Pac Is	156	90	14	101	88	13	.9	255	.357
Afr American	68	84	17	56	81	22	.9	122	.358
Hispanic	74	88	13	45	85	18	1.0	117	.332
White	326	89	13	212	87	17	2.1	536	.037
GENDER									
Female	412	89	14	272	86	17	2.1	682	.039
Male	227	89	14	147	86	17	1.8	372	.079

Once the data was disaggregated by curriculum category, I found that significant differences in attendance between the lecture and repertoire groups were largely due to attendance patterns in the social science curriculum category. Table 5, Significant Attendance Findings by Curriculum Category, displays these findings.

Table 5

Significant Attendance Findings by Curriculum Category

	Lecture			Repertoire			Statistics		
	N	M	SD	N	M	SD	t	df	p
HUMANITIES									
Asian/Pac Is	32	94	06	27	89	09	2.89	57	.005
SOCIAL SCIENCE									
Age Under 25	95	86	15	68	81	18	2.09	161	.038
Age 25 & Over	57	89	12	40	79	27	2.43	95	.017
English	142	87	14	104	80	22	2.97	244	.003
Asian/Pac Is	32	92	07	20	82	16	3.20	50	.002
Afr American	19	88	11	13	69	33	2.32	30	.027
Female	107	86	16	85	79	23	2.21	190	.028
Male	43	92	07	23	84	16	2.89	64	.005

As displayed in Table 5, regardless of age or gender, attendance was significantly better in lecture-based social science classes. Furthermore, native English speakers,

Asian/Pacific Islander, and African American students were found to attend lecture-based social science classes significantly better than they attended those taught using a repertoire of methodologies. The only other significant finding in the disaggregated data was that Asian/Pacific Islander students attended lecture-based humanities classes better than they attended those taught using a repertoire of methodologies. No significant findings were found in the business or science/math curriculum categories.

Successful Course Completion

Successful course completion was measured by final grades received and course completion/withdrawal. Each is discussed separately.

Final Grades. Final grades were measured by grade point average (gpa) on a 4-point scale, as shown in Table 6, Final Grade Averages by Methodology Group. Overall, final grades slightly favored those classes taught using lecture methodology. In addition, re-entry, native English speakers, Asian/Pacific Islander, white, and female students received higher final grades in lecture-based classes. On the other hand, students under age 25, ESL, African American, Hispanic, and male students received higher grades in those classes taught using a repertoire of methodologies. None of these findings, however, were statistically significant.

The fact that students under age 25 were more likely to receive a higher grade average in classes taught with a repertoire of teaching methodologies may be reflective of their recent experience with student-centered, activity-based methodologies in local feeder high schools. As a part of their restructuring efforts, many local feeder high schools have been experimenting with student-directed teaching strategies in recent years. As a result, some of the younger students in this study were likely to have experienced group-based instruction, such as would be included in those classes taught using a repertoire of methodologies.

Table 6

Final Grade Averages by Methodology Group

	Lecture			Repertoire			Statistics		
	N[a]	M[b]	SD	N[a]	M[b]	SD	t	df	p
OVERALL	666	2.71	1.28	495	2.67	1.26	.6	1,159	.551
AGE									
Under 25	424	2.44	1.29	332	2.49	1.26	- .5	754	.594
25 and Over	242	3.17	1.13	161	3.01	1.21	1.3	401	.184
LANGUAGE									
ESL	54	2.57	1.35	40	2.75	1.34	- .6	92	.533
English	612	2.72	1.28	453	2.65	1.26	.8	1,063	.417
RACE/ETHNICITY									
Native Amer	18	2.67	1.37	9	2.67	1.23	.0	25	1.000
Asian/Pac Is	160	2.71	1.22	116	2.58	1.25	.9	274	.391
Afr American	73	2.29	1.39	65	2.32	1.31	- .2	136	.878
Hispanic	80	2.34	1.39	55	2.58	1.33	-1.0	133	.308
White	335	2.89	1.23	250	2.80	1.23	.8	583	.422
GENDER									
Female	425	2.86	1.27	311	2.79	1.19	.7	734	.483
Male	239	2.43	1.28	180	2.46	1.34	- .2	417	.815

[a] N includes grades of A, B, C, D, and F. Withdrawals were not included.

[b] Mean grade point average (gpa) computed on a 4-point scale, with A = 4; B = 3; C = 2; D = 1; and F = 0.

When disaggregated by curriculum groups, no significant findings were found using standard procedures for computing the t-score for groups of equal size. Within the science/math curriculum category, however, findings for students under age 25 and ESL students were statistically significant in favor of the repertoire group when analyzed using specialized procedures for computing the t-score for groups of unequal size. Table 7, Significant Final Grade Averages by Curriculum Category, displays these findings, which were consistent with collegewide findings for these groups of students.

Table 7

Significant Final Grade Averages by Curriculum Category

	Lecture			Repertoire			Statistics		
	N	M	SD	N	M	SD	t	df	p
SCIENCE/MATH									
Age under 25	168	2.57	1.33	92	2.87	1.09	-1.87[a]	258	.062
							-1.98[b]	220	.048
ESL	20	2.45	1.67	11	3.36	.07	-1.73[a]	29	.095
							-2.15[b]	27	.041

[a] t-score for samples of equal size.

[b] t-score for samples of unequal size.

Course Completion. Successful course completion was operationally defined as a grade of A, B, or C. Failure to successfully complete a course was operationally defined as a grade of D, F, or W. The percent of successful course completions was 67.7 for the lecture and 69.3 for the repertoire group.

One of the more interesting findings with respect to course completion was the percent of final grades A, B, C, D, F (academic completion) and W (withdrawal) received by students in each methodology group. First of all, grades did not follow the normal bell curve. The grade given most often regardless of methodology was A, awarded 28.7 percent of the time in the lecture group and 26.5 percent of the time in the repertoire group. The second most often awarded grade regardless of methodology was B, given 22.8 percent of the time in the lecture group and 22.4 percent of the time in the repertoire group. The grade given least regardless of methodology was D, awarded 6.3 percent of the time in the lecture group and 4.3 percent of the time in the repertoire group. A grade of F was given 8.0 percent of the time in the lecture group and 8.5 percent of the time in the repertoire group. Grades of W were given in virtually identical proportions regardless of methodology: 18.0 percent of the time in the lecture group and 17.9 percent of the time in the repertoire group.

The one difference in course completion by the lecture and the repertoire groups was found in comparing the percent of C versus W grades for the two methodology groups. The third most commonly awarded grade in the lecture group was a W (18.0 percent) followed by a grade of C (16.3 percent). On the other hand, the third most commonly awarded grade in the repertoire group was a C (20.4 percent) followed by W (17.9 percent). When viewed from successful course completion (grade of A, B, or C) versus unsuccessful course completion (grade of D, F, or W), the difference between the percentage of successful course completion in the lecture group (67.7 percent) versus successful course completion in the repertoire group (69.3 percent) was 1.6 percent. This percentage, while not large, was primarily due to the relative position of the C versus W grades in the two methodology groups.

To determine whether the slight differences previously reported were significant for the college as a whole and for any of the four curriculum categories, chi-squares were computed. Table 8, Successful Course Completion by Methodology Group, displays the result.

Table 8

Successful Course Completion by Methodology Group

	Lecture		Repertoire		Statistic		
	N	Expected Value	N	Expected Value	X^2	df	p
COLLEGE							
Success	550	555.5	418	412.5			
Failure	262	256.5	185	190.5	.40	1	.526
BUSINESS							
Success	66	62.6	53	56.4			
Failure	46	49.4	48	44.6	.90	1	.344
HUMANITIES							
Success	156	154.8	102	103.2			
Failure	54	55.2	38	36.8	.09	1	.766
SCIENCE/MATH							
Success	209	209.7	130	129.3			
Failure	83	82.3	50	50.7	.02	1	.879
SOCIAL SCIENCE							
Success	119	131.3	133	120.7			
Failure	79	66.7	49	61.3	7.15	1	.008

As Table 8 shows, the difference between successful and unsuccessful course completion was significant at the .008 level in the social science curriculum category. No other significant findings were found. Based on these findings, I

concluded that the C versus W relationship just described primarily affected the social science classes. While this finding may be related to sampling error, it is nevertheless interesting and potentially revealing. Students in social science classes were significantly more likely to successfully complete classes taught using a repertoire of methodologies.

Summary

Generally speaking, findings regarding student outcomes (attendance, final grades, and course completion) favored courses taught using lecture. Attendance patterns favoring lecture classes were statistically significant overall, as well as for re-entry, native English speakers, white, and female students. Within the curriculum categories, attendance patterns favoring lecture classes were statistically significant for Asian/Pacific Islander students in both humanities and social science. Additionally, African American and native English speakers attended lecture-based social science classes better than they attended classes taught using a repertoire of methodologies.

Findings were mixed for final grades; none of the findings were significant collegewide. Within the science/math curriculum category, students under age 25 and ESL students received significantly higher grades in those classes taught using a repertoire of methodologies.

Findings for course completion slightly favored those classes taught using a repertoire of methodologies. The only statistically significant finding was that students more successfully completed social science classes taught using a repertoire of methodologies.

Question 2: Students' Perceptions of Opportunity to Succeed

Research findings for question 2, "Comparing community college instructors who believe they have a teaching repertoire with those who believe they do not, what is the effect on their students' perception of opportunity to succeed in the course?" revealed that while students perceived they had opportunity to succeed in both lecture and repertoire methodology groups, they were generally more comfortable with lecture-based classes.

To determine students' perceptions of their opportunity to succeed, I asked students to indicate the degree to which they agreed with five statements about learning outcomes contained in questions 11 through 15 of the student survey. The students' responses were coded as follows: strongly agree = 4; agree = 3; disagree = 2; strongly disagree = 1. Table 9 lists the statements in questions 11 through 15.

Table 9

Perception of Opportunity to Succeed Survey Questions

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11. I believe I have opportunity to be successful in this course.
12. My grade in this course accurately reflects what I have learned.
13. The instructor motivates me to learn.
14. I feel successful in this course.
15. The learning experiences in this course are helpful to me.

Table 10, Students' Perceptions of Opportunity to Succeed, displays the frequency, mean, and standard deviation of student responses to questions 11 through 15, as well as the average response to the five questions. While the *t*-score for each question, as well as the *t*-score for the average of the five questions, was statistically significant in favor of the lecture methodology group, it is also noteworthy that the mean of students' responses to each question, as well as the average, was greater than 3.0 for both the lecture and the repertoire groups. Therefore, students believed they had opportunity to succeed regardless of the methodology, but they felt they had greater opportunity to succeed in the lecture group.

Table 10 also provides the average response for the various demographic groups. In every demographic category, the average response was greater than 3.0, indicating that students perceived that they had opportunity to succeed regardless of methodology group. While not all findings were significant, the majority favored the lecture group. Findings were significant regardless of age or use of English language. Race/ethnic categories that were significant included Asian/Pacific Islander and white groups. Female students favored lecture at a significant level; males favored lecture, but not at a statistically significant level. Two groups, Native American and Hispanic, favored the repertoire methodology group. Findings, however, were not significant.

Table 10

Students' Perceptions of Opportunity to Succeed by Methodology Group

	Lecture			Repertoire			Statistic		
	N	M	SD	N	M	SD	t	df	p
OVERALL									
Question 11	464	3.61	.55	396	3.45	.62	3.90	858	.000
Question 12	459	3.37	.73	396	3.19	.72	3.68	853	.000
Question 13	458	3.46	.65	391	3.26	.68	4.34	847	.000
Question 14	452	3.32	.74	388	3.10	.76	4.19	838	.000
Question 15	455	3.57	.61	393	3.36	.69	4.72	846	.000
Average	466	3.46	.55	402	3.26	.54	5.29	866	.000
AVERAGE FOR DEMOGRAPHIC GROUPS									
Age Under 25	284	3.38	.57	295	3.20	.52	3.88	577	.000
Age 25/Over	182	3.58	.49	105	3.43	.55	2.38	285	.018
ESL	45	3.46	.48	41	3.20	.40	2.73	84	.008
English	403	3.48	.55	346	3.27	.56	5.30	747	.000
Native Amer	12	3.45	.51	10	3.68	.42	-1.14	20	.267
Asian/Pac Is	109	3.45	.48	116	3.28	.48	2.63	223	.009
Afr American	44	3.28	.59	40	3.15	.56	1.04	82	.303
Hispanic	56	3.27	.60	39	3.36	.43	- .77	93	.440
White	245	3.54	.54	197	3.24	.57	5.66	440	.000
Female	298	3.54	.55	270	3.30	.51	5.43	566	.000
Male	166	3.31	.52	129	3.20	.58	1.77	293	.077

Table 11, Significant Findings: Students' Perceptions of Opportunity to Succeed by Curriculum Category, provides detailed data pertaining to average responses to the five questions for the various demographic categories that were significant. As the data show, all significant findings favored the lecture group, consistent with the collegewide findings.

It is noteworthy, however, that average responses indicated that students believed they had opportunity to succeed regardless of methodology, in that none of the mean values were less than 3.0. This finding is also consistent with the collegewide finding. Furthermore, while not statistically significant, Native American students perceived they had greater opportunity to succeed in humanities and science/math classes taught using a repertoire of methodologies. At the same time, Hispanic students perceived they had greater opportunity to succeed in business, science/math, and social science classes taught using a repertoire of methodologies. These findings are also consistent with the collegewide data; and, while not statistically significant, these findings were also consistent with research findings regarding success of Native American and Hispanic students (Fox, 1986; Hurtado, 1986; Khan & Donlevy, 1991).

Table 11

Significant Findings: Students' Perceptions of Opportunity to Succeed by Curriculum Category

	Lecture			Repertoire			Statistic		
	N	M	SD	N	M	SD	t	df	p
BUSINESS									
ESL	6	3.53	.52	9	3.08	.22	2.37	13	.034
HUMANITIES									
Overall	131	3.53	.50	113	3.29	.51	3.62	242	.000
Age Under 25	80	3.45	.52	89	3.23	.49	2.81	167	.006
ESL	16	3.59	.46	16	3.24	.42	2.26	30	.031
English	114	3.53	.51	97	3.30	.52	3.18	209	.002
Asian/Pac Is	27	3.67	.39	32	3.37	.42	2.82	57	.007
Female	81	3.63	.50	66	3.38	.45	3.13	145	.002
SCIENCE/MATH									
White	102	3.56	.50	64	3.26	.57	3.60	164	.000
SOCIAL SCIENCE									
Overall	84	3.48	.62	114	3.18	.57	3.66	196	.000
Age Under 25	56	3.36	.66	84	3.11	.54	2.53	56	.012
Age 25/Over	28	3.73	.43	30	3.37	.61	2.56	56	.013
English	76	3.51	.63	107	3.16	.57	3.81	181	.000
White	50	3.54	.66	66	3.13	.59	3.50	114	.001
Female	56	3.63	.55	82	3.22	.54	4.42	136	.000

Summary

While students perceived that they had opportunity to succeed in both methodology groups, they believed they had somewhat more opportunity to succeed in those classes included in the lecture group. This finding was consistent in each curriculum category and for all demographic groups, with the exception of Native American and Hispanic groups, who perceived that those classes taught with a repertoire of methodologies provided greater opportunity for success in certain curriculum areas.

Question 3: Curriculum Consonance

Research findings for question 3, "Considering instructors' perception of the operational curriculum, to what extent do community college instructors achieve curriculum consonance?" generally support the conclusion that instructors did achieve curriculum consonance. I compared the formal curriculum to the course syllabus for each class included in the study to determine if course objectives, course content, and Title V requirements were met. In addition, I surveyed instructors and students and compared the results to determine if instructors and students were in agreement regarding the experiential curriculum. I concluded that the instructors achieved curriculum consonance if all course requirements were met and instructor and student surveys were in agreement.

Course Syllabi

I examined the course syllabi, checking for consistency between the approved formal curriculum and the syllabus for each class. Elements examined included course description, course objectives, and course content. In addition, I looked for written evidence that three components required by Title V regulations were met: written assignments, outside assignments, and critical thinking assignments.

I found that the written materials from each class included in the study indicated compliance with Title V requirements. In addition, the course description, course objectives, and course content as described in each syllabus were consistent with information provided in the formal, approved curriculum. These findings were not unexpected. As a result of statewide regulation, faculty in California community colleges review approved course outlines a minimum of once every three years to determine if the approved course outline is consistent with classroom practice. If it is found that the course has changed, the formal curriculum is rewritten. Furthermore, staff development activities in recent semesters at Cosumnes River College have included presentations on these regulatory requirements. In addition, recent staff development efforts have included workshops on preparation of a course syllabus.

Instructors' Perceptions of Curriculum Consonance

To determine instructors' perceptions of curriculum consonance, I asked instructors to indicate the degree to which they agreed with six statements about course content contained in questions 9 through 14 of the instructor survey. The instructors' responses were coded as follows: strongly agree = 4; agree = 3; disagree = 2; strongly disagree = 1. Table 12, Curriculum Consonance Survey Questions (Instructors), lists the statements in questions 9 through 14.

Table 12

Curriculum Consonance Survey Questions (Instructors)

9.	The written course information provided students on the first day of class (course syllabus) accurately describes the course as it is being taught in this course section.
10.	The course syllabus follows the approved curriculum as described in the official course outline of record.
11.	I follow the sequence of instruction as described in the course syllabus for this course section.
12.	The course syllabus accurately describes my expectations of student performance in this course section.

(table continued)

Curriculum Consonance Survey Questions (Instructors)

13. I follow the grading policy described in the course syllabus for this course section.
14. Student learning experiences in this course section are designed to achieve the objectives for the course as described in the official course outline of record.

In addition to summarizing the results for each question, I computed the average response for the six statements for the college and for each of the four curriculum areas. These data are displayed in Table 13, Instructors' Perceptions of Curriculum Consonance. None of the findings were significant, indicating that the instructors perceived no difference in course content between lecture and repertoire groups. Furthermore, given that the mean for each question and for the average of all questions was 3.5 or higher, I concluded that the instructors perceived that the formal and the operational curriculum were consonant.

Table 13

Instructors' Perceptions of Curriculum Consonance by Methodology Group

	Lecture			Repertoire			Statistic		
	N	M	SD	N	M	SD	t	df	p
OVERALL									
Question 9	22	3.73	.46	22	3.64	.58	.58	42	.567
Question 10	22	3.82	.40	22	3.91	.29	- .87	42	.391
Question 11	22	3.68	.48	22	3.77	.43	- .66	42	.510
Question 12	22	3.77	.53	22	3.68	.48	.60	42	.552
Question 13	22	3.86	.35	22	3.77	.43	.77	42	.446
Question 14	22	3.77	.43	22	3.77	.43	.00	42	1.000
Average	22	3.77	.33	22	3.76	.28	.16	42	.872
BUSINESS	4	3.88	.16	4	3.67	.24	1.46	6	.194
HUMANITIES	7	3.81	.28	7	3.81	.20	- .01	12	.991
SCIENCE/MATH	6	3.67	.46	6	3.92	.14	-1.28	10	.230
SOCIAL SCIENCE	5	3.77	.36	5	3.57	.45	.78	8	.457

Students' Perceptions of Curriculum Consonance

To determine students' perceptions of curriculum consonance, I asked students to indicate their agreement with each of five statements about course content contained in questions 6 through 10 of the student survey. The students' responses were coded as follows: strongly agree = 4; agree = 3; disagree = 2; strongly disagree = 1. Table

14, Curriculum Consonance Survey Questions (Students), lists the statements in questions 6 through 10.

Table 14

Curriculum Consonance Survey Questions (Students)

6.	The written course information the instructor distributed on the first day of class (course syllabus) accurately describes the course as it is being taught.
7.	The instructor follows the sequence of instruction as described in the course syllabus.
8.	The instructor follows the grading policy as described in the course syllabus.
9.	The learning experiences in this course address the course objectives as described in the course syllabus.
10.	The course syllabus accurately describes the learning experiences I have had in the course.

In addition to summarizing the results for each question, I computed the average response for the five statements for the college and for each of the four curriculum areas. These data are displayed in Table 15, Students' Perceptions of Curriculum Consonance. The students indicated agreement with each of the statements, regardless of methodology group. However, unlike instructors, the students did perceive a difference between the lecture and repertoire groups that was statistically

significant. That difference was consistently in favor of the lecture method. At the same time, however, means for each question and for the averages in each of the curriculum categories exceeded 3.0 for the repertoire group, as well. I, therefore, concluded that the students agreed that the experiential curriculum and the operational curriculum were consonant in spite of their preference for the lecture group.

Table 15

Students' Perceptions of Curriculum Consonance by Methodology Group

	Lecture			Repertoire			Statistic		
	N	M	SD	N	M	SD	t	df	p
OVERALL									
Question 6	465	3.67	.53	403	3.56	.57	3.13	866	.002
Question 7	463	3.65	.52	402	3.47	.57	5.07	863	.000
Question 8	464	3.75	.45	401	3.60	.54	4.51	863	.000
Question 9	462	3.68	.48	395	3.51	.55	4.80	855	.000
Question 10	457	3.57	.53	396	3.41	.58	4.27	851	.000
Average	465	3.66	.40	404	3.50	.44	5.60	865	.000
BUSINESS	51	3.56	.43	53	3.58	.39	- .28	102	.783
HUMANITIES	131	3.65	.40	114	3.55	.42	1.88	243	.061
SCIENCE/MATH	199	3.70	.38	122	3.55	.44	3.10	319	.002
SOCIAL SCIENCE	84	3.66	.38	115	3.37	.45	4.78	197	.000

Nonparticipant Observation

One observation made by the researcher was that implementation of student-directed, group-based teaching methodologies varied widely from class to class and was interpreted very differently by various instructors who participated in the investigation. There was no single definition of collaborative learning, for example, that was understood by instructors at the college. As a result, I observed much variability in practice of the teaching repertoire. While these differences were noted, they were not sufficient in and of themselves to conclude that these community college instructors had not achieved curriculum consonance.

This variability, however, indicates a strong need for staff development to address a common definitional understanding of research-based methodologies. While it is not possible to know for sure, students' preferences for lecture-based classes may have been associated with instructors' failures to communicate their methodologies used in the repertoire group.

Summary

My analysis of written documentation and my nonparticipant observation, as well as the surveys of instructors and students, generally supported the conclusion that curriculum consonance was achieved.

Alternative Explanations for Findings

It is possible that the study findings were related to methodological limitations or other forces inherent in the change process rather than to the effects of the teaching-learning environment of the classes taught using lecture versus the classes taught using a repertoire of methodologies. With this in mind, I would like to close with a brief discussion of two alternative explanations for the findings.

Effect of Limitations on Findings

Recognizing that the study methodology had many limitations, it is possible that the study design may have been defective, in that key elements were not controlled. Perhaps of greatest potential significance was the fact that data was based on self-report. In addition, interactions between the teaching methodologies employed, student characteristics, student motivation, instructor characteristics, and methods of assessment were not controlled, even though the researcher attempted to minimize the effect of these variables.

Among the efforts to minimize the effect of uncontrolled variables were the following. The study included attendance as a variable. This helped to assure that I would not attribute a specific outcome to methodology when, in fact, the student's attendance in the course was marginal. In addition, instructors were favorably

recommended by their immediate supervisors before being included in the study. Only those instructors who had a history of successful teaching, positive rapport with students, and fully successful teaching evaluations were invited to participate. Finally, student demographic characteristics were examined to verify that the study sample approximated the college demographic profile.

In addition to the human interactional limitations of the study methodology, I developed the survey instruments used to obtain student and instructor perceptions of course content, opportunity to succeed, and learning outcomes. As such, the surveys may not have been reliable and valid. The instruments were piloted two times prior to use and were revised based on comments from participants in the pilot studies.

To minimize the effect of potentially invalid or unreliable survey instruments, I observed every class participating in the study to obtain independent verification of the methodologies employed. In addition, both students and instructors were surveyed to ensure a broad perspective. Finally, course syllabi were reviewed to confirm survey and observational findings.

Beyond these efforts to consider the numerous potential human interactional variables and methodological weaknesses, it was not possible to control the effect of any number of variables that may have impacted the findings of this study.

Furthermore, it is impossible to know for sure if any of the uncontrolled variables did, in fact, cause the results.

Effect of Change Process on Findings

A second potential explanation for the findings can be found in the inherent complexities of the school change process. Cosumnes River College, like many other community colleges in California, has participated in a variety of research efforts within the past five years designed to identify innovative practice. Among these are various investigations including writing across the curriculum; critical thinking across the curriculum; classroom based assessment; application-based mathematics curriculum; and in-class tutoring in mathematics.

In addition, since the passage of Assembly Bill 1725, the California community college reform legislation, in August 1988, categorical funding of staff development has been available. Approximately $40,000 per year has been used at Cosumnes River College. Furthermore, beginning in August 1989, five college-wide staff development days per academic year when classes are not scheduled have been available to faculty and staff. The combination of time, money, and an interest in instructional improvement have combined to begin the process of fundamental change in instructional practices at the college.

Five years ago, it would not have been possible to have completed this study at Cosumnes River College because very

few, if any, classes were taught other than with the lecture method. During Spring 1994, 27 classes were identified by self-report of the instructors as student-centered, activity based. After the nonparticipant observation, 22 of these classes were determined to be adequately focused on the use of a repertoire of methodologies to be used in the study.

Based on the literature of the educational change process (Fullan, 1991; Hall & Hord, 1984; Marsh, 1992), it appears to me that use of a repertoire of teaching methodologies is in the initiation phase of the change cycle at Cosumnes River College. In 1993, approximately 1.5 million dollars was obtained through a five-year Title III grant written by college faculty and staff. This grant includes funding to examine alternative teaching methodologies, such as collaborative learning strategies, multimedia technology, and peer learning groups.

One observation previously noted is that implementation of student-directed, group-based teaching methodologies varies widely from class to class and is interpreted very differently by various instructors. It is probable that, in spite of previous staff development efforts, instructors do not share a common language to describe teaching and learning at this college. As a result, I observed variability in practice.

Conclusion

This investigation, in spite of its limitations, adds to the growing body of literature on the impact of the learning experience of diverse community college students on measures of institutional effectiveness, including successful course completion. The literature regarding culturally diverse students was generally affirmed by findings in this study. All other findings, particularly with respect to the effect of age and gender, were mixed and, at times, inconclusive.

You are cautioned that weaknesses in the study design and the effect of the change process believed to have been present at the time the data were gathered are likely to have influenced the findings and may account for the fact that findings were mixed and inconclusive. In any case, study results cannot be generalized beyond Cosumnes River College and should be cautiously considered by practitioners.

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